

WHAT IS CLAIMED IS:

1. An OSI tunnel routing method in which
an IP packet which is encapsulated in an OSI packet
5 is transmitted between transmission apparatuses each
connected to an IP network in which said
transmission apparatuses form an OSI network, said
method comprising the steps of:

10 said transmission apparatuses exchanging
reachable IP network addresses and each own OSI
network address on said OSI network;

each of said transmission apparatuses
generating an OSI tunnel table which includes OSI
network addresses of said transmission apparatuses
15 and said reachable IP network addresses; and

a first transmission apparatus in said
transmission apparatuses which receives an request
to access an IP address determining a second
transmission apparatus which can transfer data for
20 said IP address by referring to said OSI tunnel
table, and generating an OSI tunnel between said
first transmission apparatus and said second
transmission apparatus.

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2. The OSI tunnel routing method as
claimed in claim 1, further comprising the step of:

30 deleting said OSI tunnel when said OSI
tunnel is not used for a predetermined time.

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3. The OSI tunnel routing method as
claimed in claim 1, further comprising the step of:

generating a new OSI tunnel by using an alternate route and switching said OSI tunnel to said new OSI tunnel when a failure occurs in a route of said OSI tunnel.

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4. The OSI tunnel routing method as
10 claimed in claim 3, further comprising the step of:
switching said new OSI tunnel back to said
OSI tunnel when said route recovers from said
failure within a predetermined time.

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5. The OSI tunnel routing method as
claimed in claim 1, further comprising the step of:
20 a third transmission apparatus in said
transmission apparatuses receiving an address
resolution request, and sending a MAC address of
said third transmission apparatus when said address
resolution request is for an IP address which is
25 reachable by said third transmission apparatus.

30 6. The OSI tunnel routing method as
claimed in claim 1, further comprising the step of:
said first transmission apparatus sending
an OSI tunnel generation request to said second
transmission apparatus when generating said OSI
35 tunnel.

7. The OSI tunnel routing method as
claimed in claim 6, further comprising the step of:
5 said second transmission apparatus
receiving said OSI tunnel generation request,
generating an OSI tunnel, and sending an OSI tunnel
generation response to said first transmission
10 apparatus.

8. The OSI tunnel routing method as
15 claimed in claim 1, further comprising the step of:
 said first transmission apparatus sending
an OSI tunnel deletion request to said second
transmission apparatus when said OSI tunnel is not
20 used for a predetermined time.

9. The OSI tunnel routing method as
25 claimed in claim 8, further comprising the step of:
 said second transmission apparatus
deleting said OSI tunnel when receiving said OSI
tunnel deletion request, and sending an OSI tunnel
deletion response to said first transmission
30 apparatus.

10. A transmission apparatus which
35 transmits an IP packet which is encapsulated in an
OSI packet to another transmission apparatus in

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which each of said transmission apparatus and said another transmission apparatus is connected to an IP network, and said transmission apparatus and said another transmission apparatus form an OSI network, said transmission apparatus comprising:

an OSI tunnel propagation part exchanging reachable IP network addresses and an own OSI network address on said OSI network;

an OSI tunnel table generating part generating an OSI tunnel table which includes said OSI network address and said reachable IP network addresses; and

an OSI tunnel generation part, when said transmission apparatus receives an request to access an IP address, determining a first transmission apparatus which can transfer data for said IP address by referring to said OSI tunnel table, and generating an OSI tunnel between said transmission apparatus and said first transmission apparatus.

11. The transmission apparatus as claimed in claim 10, further comprising:

an OSI tunnel deletion part deleting said OSI tunnel when said OSI tunnel is not used for a predetermined time.

12. The transmission apparatus as claimed in claim 10, further comprising:

an OSI tunnel switching part generating a new OSI tunnel by using an alternate route and switching said OSI tunnel to said new OSI tunnel

when a failure occurs in a route of said OSI tunnel.

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13. The transmission apparatus as claimed
in claim 12, wherein said OSI tunnel switching part
switches said new OSI tunnel back to said OSI tunnel
when said route recovers from said failure within a
10 predetermined time.

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14. The transmission apparatus as claimed
in claim 10, further comprising:

an address resolution part receiving an
address resolution request, and sending a MAC
address of said transmission apparatus when said
20 address resolution request is for an IP address
which is reachable by said transmission apparatus.

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15. The transmission apparatus as claimed
in claim 10, said OSI tunnel generation part
comprising:

an OSI tunnel generation request part
30 sending an OSI tunnel generation request to said
first transmission apparatus.

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16. The transmission apparatus as claimed
in claim 15, said OSI tunnel generation part further

comprising:

an OSI tunnel generation response part
receiving said OSI tunnel generation request,
generating an OSI tunnel, and sending an OSI tunnel
5 generation response to an transmission apparatus
which sent said OSI tunnel generation request.

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17. The transmission apparatus as claimed
in claim 11, said OSI tunnel deletion part
comprising:

an OSI tunnel deletion request part
15 sending an OSI tunnel deletion request to an
transmission apparatus on the other end of an OSI
tunnel which is not used for a predetermined time.

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18. The transmission apparatus as claimed
in claim 17, said OSI tunnel deletion part further
comprising:

an OSI tunnel deletion response part
25 deleting said OSI tunnel which is not used for a
predetermined time when receiving said OSI tunnel
deletion request, and sending an OSI tunnel deletion
response to an transmission apparatus which sent
30 said OSI tunnel deletion request.

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